NONDESTRUCTIVE TESTING (N.D.T.) OF WELDS

IR 17-2

Reference: California Building Code, Title 24, Part 1, Section 4-335 Revised 10-15-07

Discipline: Structural Issued 05-15-07 as CR 17-2

This Interpretation of Regulations (IR) is intended for use by the Division of the State Architect (DSA) staff, and as a resource for design professionals, to promote more uniform statewide criteria for plan review and construction inspection of projects within the jurisdiction of DSA, which include State of California public elementary and secondary schools (grades K-12), community colleges, and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is reviewed on a regular basis and is subject to revision at any time. Please check the DSA web site for currently effective IR's. Only IR's listed in the document at http://www.dsa.dgs.ca.gov/Pubs/default.htm (click on "DSA Interpretations of Regulations Manual") at the time of plan submittal to DSA are considered applicable.

This IR applies also to testing laboratories, technicians and special inspectors working on projects under DSA jurisdiction.

1. Purpose: The purpose of this Interpretation of Regulations (IR) is to clarify the minimum requirements for the qualification and certification of facilities, and their personnel, that perform nondestructive testing (NDT) of welds. It is applicable to the performance of the following NDT test methods: liquid penetrant (PT), magnetic particle (MT), ultrasonic (UT) and radiographic (RT) testing.

2. Background: This IR does not apply to visual inspection during the welding operation. NDT is considered a test, not an inspection. Title 24, Part 1 Section 4-335 requires that all tests are to be conducted by a testing facility acceptable to Division of the State Architect (DSA). Testing facilities are evaluated and accepted by DSA through the Laboratory Evaluation and Acceptance (LEA) program. Nondestructive testing shall be performed only by currently approved LEA facilities.

3. Requirements: Facilities performing NDT for projects under DSA jurisdiction shall meet the following requirements for facilities, NDT program, personnel and reporting:

3.1 NDT Facilities:

3.1.1 Only currently approved LEA facilities may perform NDT. LEA facilities are listed on the DSA web site, on the Testing Laboratories web page (http://www.dsa.dgs.ca.gov/labs/default.htm).

3.1.2 The LEA facility may perform only those NDT test methods that are accepted through the LEA program.

3.1.3 The California Registered civil engineer with engineering managerial responsibility for the LEA facility (the laboratory engineer) shall be responsible for overall implementation of the facility's NDT program, including supervision of the Level III administrator.

3.1.4 All NDT testing equipment must be kept calibrated and the use controlled by the laboratory engineer.

3.2 Facility's NDT Program:

3.2.1 The NDT program of an LEA facility must be administered by an individual with valid certification as an NDT Level III by the American Society for Nondestructive

Testing (ASNT). The NDT administrator's Level III certification must be obtained through the successful completion of an examination given by ASNT, or an ASNT authorized examination center. The NDT administrator's certification must be current and verifiable on the ASNT website. The NDT administrator must be certified in all NDT test methods for which the facility has been accepted, or is seeking acceptance, through the LEA program. The NDT administrator may be an employee of the facility or a contracted individual from an outside organization. The NDT administrator is, at a minimum, responsible for:

a) Developing, administering, and grading all general, specific, and practical exams for Level I and II NDT personnel,

b) Creating and maintaining qualification and certification records for all Level I and II personnel, and

c) Supervising and monitoring the NDT work of all Level I and II NDT personnel.

3.2.2 The NDT program must meet the American Society of Testing and Materials (ASTM) Standards E 543–04 and E 1212–04.

3.2.3 The NDT program shall include a "certification program" which clearly outlines qualifications and certification of nondestructive testing personnel. The certification program must meet the requirements of ANSI/ASNT CP-189-2001 and be approved by the NDT administrator (see Section 3.2.1 above) and the laboratory engineer (see Section 3.1.3 above).

3.2.4 The NDT program shall include written method-specific procedures applicable to all NDT methods for which the facility is LEA approved. The written procedures must meet the requirements of applicable ASTM standards (as listed below) and be approved by the NDT administrator and the laboratory engineer.

Test Method	**ASTM Standards**
Liquid Penetrant (PT)	E-165-02, E1417-05
Magnetic Particle (MT)	E-1444-05, E-709-01
Ultrasonic (UT)	E-164-03, E-587-00, E114-95, A-898-91
Radiographic (RT)	E-1032-01, E-94-04, E-1742-05

3.2.5 Written procedures that meet the requirements of ANSI/AWS D1.1-04 Structural Welding Code – Steel, shall be required for ultrasonic flaw detection of weldments.

3.3 Personnel Performing NDT:

3.3.1 NDT shall be performed by personnel with valid certification as NDT Level II. Certification records must include the signature and printed name of both the NDT administrator and the laboratory engineer. Evidence of certification shall be presented to the project inspector and maintained on the project site. Evidence of certification shall be available for review by the DSA field engineer.

3.3.2 NDT shall be performed in accordance with the DSA approved documents, California Code of Regulations Title 24, The American Welding Society (AWS) D1.1–04, D1.8-05, applicable ASTM standards, and the facility's written procedures.

3.4 Reporting:

3.4.1 The NDT Level II technician is required to issue a daily report that includes records of equipment calibration and a systematic record of all welds tested and accepted.

3.4.2 Test reports must state that materials were tested in accordance with and met the requirements of the DSA approved documents. Reports must be submitted as required by C.C.R. Title 24, Part 1, Section 4-335 (d). A sample report template (DSA 210) is available on the DSA web site.

3.4.3 Reports shall be sent to the school district and copied to the architect, structural engineer, project inspector, and DSA within 14 days of the date of the test. Reports shall also be presented to the project inspector on a daily basis. Reports indicating non-compliant materials shall be submitted immediately.

3.4.4 The California Registered civil engineer with engineering managerial responsibility for the LEA facility (Section 3.1.3 above) is responsible for signing and submitting a Laboratory Verified Report (Form DSA-291) at the conclusion of the testing program. The Laboratory Verified Report shall include all NDT testing.

4.0 Failure to Perform: Failure to perform all required nondestructive testing in a professional and competent manner, report defective work, file all required reports in a truthful and timely manner, or fulfill any other duties defined by the code may have serious consequences for the NDT technician and/or the LEA facility. These consequences include but are not limited to withdrawal of DSA approval, and/or denial of any future DSA approval to work as a NDT technician on projects under DSA jurisdiction.